**Chapter 6**

**Page 223 36A**.  **Answer to Key Problem**

Table 6.7 (completed)

|  |  |  |  |
| --- | --- | --- | --- |
| Number of Workers in Crew | TPL  (feet per day) | MP  (feet per day) | AP  (feet per day) |
| 1 | 20 | 20 | 20 |
| 2 | 80 | 60 | 40 |
| 3 | 150 | 70 | 50 |
| 4 | 200 | 50 | 50 |
| 5 | 230 | 30 | 46 |
| 6 | 246 | 16 | 41 |

b) See Figure 6.8

Figure 6.8 (completed)

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c) See Table 6.8

Table 6.8 (completed)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Number of Workers in Crew** | **TP**  **(feet per day)** | **TVC** | **AVC** | MC |
| 1 | 20 | **$240** | **$12.00** | **$12.00** |
| 2 | 80 | **480** | **6.00** | **4.00** |
| 3 | 150 | **720** | **4.80** | **3.43** |
| 4 | 200 | **960** | **4.80** | **4.80** |
| 5 | 230 | **1200** | **5.22** | **8.00** |
| 6 | 246 | **1440** | **5.85** | **15.00** |

d) See Figure 6.9

**Figure 6.9 (completed)**

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**50 100 150 200 250 300**

**Quantity of output**

e) **4** workers.

f) **200**.

g) **Minimum average variable cost** is achieved when output is **200**.

h) **3** workers.

i) **150**.

j) **Minimum marginal cost** occurs when output is **150**.

k) The conclusion is that **maximum average product** occurs using the same number of workers that are used to produce an output that **minimizes average variable costs**. Similarly, **maximum marginal product** occurs using the same number of workers that are used to produce an output that **minimizes marginal costs.**

**PP224-225 42A.** a) See Table 6.10

**Table 6.10 (completed)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Output** | **TFC** | **TVC** | **TC** | **MC** | **AFC** | **AVC** | **ATC** |
| 1 | $210 | **$100** | **$310** | $100 | **$210** | **$100** | **$310** |
| 2 | **210** | **160** | **370** | 60 | **105** | **80** | **185** |
| 3 | **210** | **210** | **420** | 50 | **70** | **70** | **140** |
| 4 | **210** | **290** | **500** | 80 | **52.50** | **72.50** | **125** |
| 5 | **210** | **390** | **600** | 100 | **42** | **78** | **120** |
| 6 | **210** | **516** | **726** | 126 | **35** | **86** | **121** |
| 7 | **210** | **672** | **882** | 156 | **30** | **96** | **126** |
| 8 | **210** | **862** | **1072** | 190 | **26.25** | **107.75** | **134** |
| 9 | **210** | **1104** | **1314** | 242 | **23.33** | **122.67** | **146** |
| 10 | **210** | **1400** | **1610** | 296 | **21** | **140** | **161** |
| 11 | **210** | **1781** | **1991** | 381 | **19.09** | **161.90** | **181** |
| 12 | **210** | **2310** | **2520** | 529 | **17.50** | **192.5** | **210** |

1. **3** units. (Average product is at a maximum where average variable cost is at a minimum)
2. $140

d) **5** units (Economic capacity is at the output level where ATC is at a minimum.)

e) $100 (A change in fixed costs has no effect on marginal costs.)

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**Key issues and decision tools drawn from this analysis:**

A Firms:

**Average Product** is at a maximum where average variable cost is at a minimum.

**Economic Capacity** occurs when ATC (Average Total Costs) are lowest – this represents the lowest COST level of output – but does not contemplate the Revenue side so it is possible to earn more revenue and potentially more profit at higher levels of output.

**Most Productive Capacity** occurs when AVC (Average Variable Costs) are lowest- this means that the cost per unit is minimized - but does not contemplate the Revenue side so it is possible to earn more revenue and potentially more profit at higher levels of output.

**Point of Diminishing Returns** occurs when MC (Marginal Costs) are lowest – after this point cost per unit of production starts to rise.